



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,769	09/29/2003	Tsuyoshi Itsukaichi	O11.2B-11338-US01	2473
490	7590	02/15/2006	EXAMINER	
VIDAS, ARRETT & STEINKRAUS, P.A. 6109 BLUE CIRCLE DRIVE SUITE 2000 MINNETONKA, MN 55343-9185			AUSTIN, AARON	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 02/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/673,769	Applicant(s) ITSUKAICHI ET AL.	
	Examiner Aaron S. Austin	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 8-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7, drawn to a thermal spray powder, classified in class 428, subclasses 357, 403 and 663.
- II. Claims 8-9, drawn to a method for producing a thermal spray powder, classified in class 427, subclass 437.
- III. Claim 10, drawn to a method for thermal spraying a thermal spray powder, classified in class 427, subclass 252.

Inventions Group I and Group II are related as a product made and process of making. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product of Group I can be made by a materially different process such as by use of an electroplating method.

Inventions Group I and Group III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product of Group I can be used in a materially different process of use such as by use in a process wherein heat is applied after spraying onto the substrate.

Inventions Group II and Group III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are a process for producing a thermal spray powder and a method for thermal spraying. A process for thermal spraying would not be used concurrently with a process of producing a thermal spray powder and they have different modes of operation, different functions, and different effects.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Scott Vidas on February 6, 2006, a provisional election was made without traverse to prosecute the invention of a thermal spray powder, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office Action. Claims 8-10 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to non-elected inventions.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1775

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Masanori (Japanese Publication No. 55044515).

Masanori teaches production of a lubricative sintered metal body. The metal body is produced by coating MoS₂ with copper. The copper is present in a percentage of 10 to 30%, thus the MoS₂ is present in a percentage of 70 to 90%. As Masanori teach use of like materials in a like manner, it would be expected that the coating layer is composed of a metal that is softened or melted at a temperature lower than the heat decomposition temperature of the molybdenum disulfide. The phrase "thermal spray powder" is considered intended use.

Claims 1-2 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Rao et al. (U.S. Patent No. 5,302,450).

Rao et al. '450 teach a thermally sprayable powder having grains comprising a core of solid lubricant particles comprised of at least graphite and MoS₂ and a soft metal shell encapsulating the core (column 2, lines 43-47). The soft metal shell is selected from the group consisting of Ni, Co, Cu, Zn, Sn, Mg, and Fe (column 2, lines 55-57). The lubricant core includes MoS₂ in the amount of 30-90% by weight. The content of the metal shell in the thermal powder is 70% to 95% by weight (column 4, line

Art Unit: 1775

58). As Rao et al. '450 teach use of like materials in a like manner, it would be expected that the coating layer is composed of a metal that is softened or melted at a temperature lower than the heat decomposition temperature of the molybdenum disulfide.

Claims 1-2 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Rao et al. (U.S. Patent No. 3,659,861).

Rao et al. '861 teach plasma sprayable particles having a core of lubricating material surrounded by a shell (column 1, lines 22-23 and claim 1). The lubricating material may be molybdenum disulfide and the shell material may preferably be nickel, copper or cobalt (column 1, lines 32-37). As Rao et al. '861 teach use of like materials in a like manner, it would be expected that the coating layer is composed of a metal that is softened or melted at a temperature lower than the heat decomposition temperature of the molybdenum disulfide.

Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Fiala et al. (U.S. Patent No. 6,887,530).

Fiala et al. teach a thermal spray composition comprising a mixture of at least 5 wt % total, preferably 19 to 60 wt % and more preferably 25 to 45 wt % of a solid lubricant and a ceramic (column 2, lines 31-33). The ratio of solid lubricant to ceramic is 1:7 to 20:1 (column 2, lines 41-42) and the solid lubricant may be molybdenum disulphide particles (column 2, lines 37-38). Further, either the ceramic particles or the

Art Unit: 1775

lubricant particles may be coated by a matrix-forming metal alloy (column 2, lines 50-52), such as Ni, Co, Cu, Fe, Al, and alloys thereof (column 2, lines 43-44).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao et al. (U.S. Patent No. 5,302,450) in view of Fiala et al. (U.S. Patent No. 6,887,530).

Rao et al. '450 teach a thermally sprayable powder as described above.

While Rao et al. '450 do teach the lubricant is in the range of 5% to 30%, they do not teach the content of molybdenum disulfide itself in the powder is 30% to 90% or 40% to 80% by weight. Further, while they do teach the content of the metal shell as being 70% to 95% by weight of the powder, they do not teach the content of the metal in the powder is between 10% and 70% or 20% to 60%.

Fiala et al. teach a thermal spray composition comprising a mixture of at least 5 wt % total, preferably 19 to 60 wt % and more preferably 25 to 45 wt % of a solid lubricant and a ceramic (column 2, lines 31-33). The ratio of solid lubricant to ceramic is 1:7 to 20:1 (column 2, lines 41-42) and the solid lubricant may be molybdenum disulphide particles (column 2, lines 37-38). Further, either the ceramic particles or the

Art Unit: 1775

lubricant particles may be coated by a matrix-forming metal alloy (column 2, lines 50-52), such as Ni, Co, Cu, Fe, Al, and alloys thereof (column 2, lines 43-44). Therefore, as it is clearly taught by Fiala et al. that a thermal spray composition comprising molybdenum disulphide particles coated with a metal coating in amounts overlapping the Applicant's claimed ranges provides the advantages of a smooth surface, low permeability, and long-term oxidation resistance (column 2, lines 20-22), it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the powder of Rao et al. '450 to include the weight ranges of Fiala et al.

Still further, a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Claims 3-4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rao et al. (U.S. Patent No. 3,659,861).

Rao et al. '861 teach plasma sprayable particles as described above.

While Rao et al. '861 do not teach the content of molybdenum disulfide itself in the powder is 30% to 90% or 40% to 80% by weight. Further, they do not teach the content of the metal in the powder is 10% to 70% or 20% to 60%.

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re*

Art Unit: 1775

Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In this case, Rao et al. '861 do not specify the workable ranges of content by weight, but they do describe the general conditions of the claim, namely the content of the claimed powder. It would not be inventive to discover the workable ranges by routine experimentation of the invention taught by Rao et al. '861. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunda (G.B. Patent No. 1,450,376).

Kunda teaches copper-coated powders for use as abradable or hard surface coating material (page 1, lines 68-81). As Masanori teach use of like materials in a like manner, it would be expected that the coating layer is composed of a metal that is softened or melted at a temperature lower than the heat decomposition temperature of the molybdenum disulfide.

While Kunda does not teach the content of molybdenum disulfide itself in the powder is 30% to 90% or 40% to 80% by weight. Further, the content of the metal in the powder is not taught with a value of 10% to 70% or 20% to 60% by weight.

"[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In this case, Kunda do not specify the workable ranges of content by weight, but they do describe the general conditions of the claim, namely the content of the claimed powder. It would not be

Art Unit: 1775

inventive to discover the workable ranges by routine experimentation of the invention taught by Kunda. Thus the claimed invention as a whole is *prima facie* obvious over the combined teachings of the prior art.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Austin whose telephone number is (571) 272-8935. The examiner can normally be reached on Monday-Friday: 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASA


JENNIFER MCNEIL
PRIMARY EXAMINER
2/13/06